CLAIMS

What is claimed is:

1. A radiation-curable composition comprising:
   (a) an acrylate oligomer having a polytetramethylene glycol backbone;
   (b) an acrylate monomer; and
   (c) at least three photoinitiators.

2. The radiation-curable composition of claim 1, wherein said acrylate monomer is propoxylated nonyl phenol acrylate.

3. The radiation-curable composition of claim 1, wherein said oligomer is derived from:
   (i) one or more polytetramethylene glycols;
   (ii) isophorone diisocyanate, dicyclohexylmethane diisocyanate, and/or the trimer of hexamethylene diisocyanate; and
   (iii) hydroxyethylacrylate.

4. The radiation-curable composition of claim 3, wherein said oligomer has a molecular weight in the range of 2,000-6,000 g/mol.

5. The radiation-curable composition of claim 1, wherein said oligomer is derived from, relative to the total weight of the oligomer:
   (i) 10-30 wt% of isophorone diisocyanate;
   (ii) 5-15 wt% of dicyclohexylmethane diisocyanate;
   (iii) 45-75 wt% of polytetramethylene glycol; and
   (iv) 5-20 wt% of hydroxyethylacrylate.

6. The radiation-curable composition of claim 2, wherein said oligomer is derived from, relative to the total weight of the oligomer:

(i) 10-30 wt% of isophorone diisocyanate;
(ii) 5-15 wt% of dicyclohexylmethane diisocyanate;
(iii) 45-75 wt% of polytetramethylene glycol; and
(iv) 5-20 wt% of hydroxyethylacrylate.

7. The radiation-curable composition of claim 1, wherein said acrylate monomer is hexane diol diacrylate.

8. The radiation-curable composition of claim 1, wherein said oligomer is derived from:

(i) one or more polytetramethylene glycols;
(ii) isophorone diisocyanate and/or dicyclohexylmethane diisocyanate;
(iii) hydroxyethylacrylate; and
(iv) optionally, hexane diol and adipic acid.

9. The composition of claim 8, wherein said oligomer has a molecular weight of 1,000-5,000 g/mol.

10. The radiation-curable composition of claim 1, wherein said oligomer is derived from, relative to the weight of the oligomer:

(i) 25-35 wt% of isophorone diisocyanate and/or dicyclohexylmethane diisocyanate;
(ii) 25-40 wt% of polytetramethylene glycol;
(iii) 15-30 wt% of hydroxyethylacrylate;
(iv) 5-15 wt% of hexane diol; and
(v) 5-15 wt% of adipic acid.

11. The radiation-curable composition of claim 7, wherein said oligomer is derived from, relative to the weight of the oligomer:

(i) 25-35 wt% of isophorone diisocyanate and/or dicyclohexylmethane diisocyanate;

(ii) 25-40 wt% of polytetramethylene glycol;

(iii) 15-30 wt% of hydroxyethylacrylate;

(iv) 5-15 wt% of hexane diol; and

(v) 5-15 wt% of adipic acid.

12. The radiation-curable composition of claim 1, wherein said composition further comprises a silane coupling agent.

13. The radiation-curable composition of claim 1, wherein said radiation-curable composition, when cured at a dose of about 4.4 mJ/cm^2, has a percentage reacted acrylate unsaturation of at least 56%.

14. The radiation-curable composition of claim 1, wherein said radiation-curable composition, when cured at a dose of about 4.4 mJ/cm^2, has a percentage reacted acrylate unsaturation of at least 60%.

15. The radiation-curable composition of claim 1, wherein said radiation-curable composition, when cured at a dose of about 4.4 mJ/cm^2, has a percentage reacted acrylate unsaturation of at least 66%.

16. The radiation-curable composition of claim 1, wherein said radiation-curable composition cures faster than a comparable composition, said comparable composition being identical to said radiation-curable composition except that said at least three

photoinitiators in said radiation-curable composition have been replaced in said comparable composition with an equal weight amount of 1-hydroxy-cyclohexyl-phenyl ketone photoinitiator.

17. The radiation-curable composition of claim 16, wherein said at least three photoinitiators include 1-hydroxy-cyclohexyl-phenyl ketone.

18. The radiation-curable composition of claim 1, wherein said oligomer comprises an aromatic group.

19. The radiation-curable composition of claim 1, wherein said oligomer is an aliphatic oligomer.

20. The radiation-curable composition of claim 3, wherein said composition is an inner primary coating composition for optical fibers.

21. A radiation curable composition comprising:

(a) an oligomer derived from, relative to the weight of the oligomer:

(i) 10-30 wt% of isophorone diisocyanate;

(ii) 5-15 wt% of dicyclohexylmethane diisocyanate;

(iii) 45-75 wt% of polytetramethylene glycol; and

(iv) 5-20 wt% of hydroxyethylacrylate;

(b) an alkoxylated alkyl substituted phenol acrylate;

(c) a photoinitiator; and

(d) a silane coupling agent;

wherein said composition, when cured at a dose of about 4.4 mJ/cm2, has a percentage reacted acrylate

unsaturation of at least 60%.

22. The radiation-curable composition of claim 21, wherein said radiation-curable composition, when cured at a dose of about 4.4 mJ/cm^2, has a percentage reacted acrylate unsaturation of at least 66%.

23. A radiation curable composition comprising:

(a) an oligomer derived from

(i) one or more polytetramethylene glycols;

(ii) isophorone diisocyanate and/or dicyclohexylmethane diisocyanate;

(iii) hydroxyethylacrylate; and

(iv) optionally, hexane diol and adipic acid;

(b) hexanediol di(meth)acrylate; and

(c) a photoinitiator;

wherein said radiation-curable composition, when cured at a dose of about 4.4 mJ/cm^2, has a percentage reacted acrylate unsaturation of at least 56%.

24. The composition of claim 23, further comprising a polydimethyl siloxane compound.

25. The composition of claim 23, wherein said oligomer is derived from, relative to the total weight of said oligomer:

(i) 25-35 wt% of isophorone diisocyanate and/or dicyclohexylmethane diisocyanate;

(ii) 25-40 wt% of polytetramethylene glycol;

(iii) 15-30 wt% of hydroxyethylacrylate;

(iv) 5-15 wt% of hexane diol; and

(v) 5-15 wt% of adipic acid.

26. The radiation-curable composition of claim 23, wherein said radiation-curable composition, when cured at a dose of about 4.4 mJ/cm^2, has a percentage reacted acrylate unsaturation of at least 60%.

27. The radiation-curable composition of claim 23, wherein said radiation-curable composition, when cured at a dose of about 4.4 mJ/cm^2, has a percentage reacted acrylate unsaturation of at least 66%.

28. The radiation-curable composition of claim 23, wherein said composition is an outer primary coating composition for optical fibers.

29. The radiation-curable composition of claim 23, wherein said oligomer comprises a polyether oligomer and a polyester oligomer.